

ESCH et al. -- Appln. No.: 08/319,490

DBP value	150 to 300 ml/100 g
$V_2/V_1$ by Hg porosimetry	0.19 to 0.46
DBP/CTAB	[3.5] <u>1.2</u> to [3.9] <u>3.5</u>

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~~Cancel~~ claims 2-6.

#### REMARKS

Reconsideration and allowance of the claims as amended is respectfully requested.

Claims 1 and 7 are pending. Claims 2-6, drawn to non-elected inventions, are cancelled without prejudice.

Claims 1 and 7 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Claim 7 is rejected under 35 U.S.C. §112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicants respectfully traverse both rejections.

Claims 1 has been amended to address the points raised by the Examiner. Claim 1 recites a DMP/CTAB range of 1.2 to 3.5. Accordingly, claim 7 is now proper since it now further limits the independent claim. In addition, claim 1 now recites that the ml of sodium hydroxide consumed corresponds to the amount of sodium hydroxide required to raise the pH to a final value of 9

(this is a measure of the silanol group density of a silica; see "Determination of the Sears Number for Silicas, Silicates and Hydrophobic Silicas" (enclosed)).

$V_1$  and  $V_2$  refer to a first and second volume measure which is inherent with the DIN 66 133 measurement (enclosed). The ratio  $V_2/V_1$  reflects a pore volume distribution of silica as determined by mercury intrusion porosimetry. This ratio is distinct from the  $V_0$  (specific volume) of Lagarde et al. A translation of the DIN 66 133 methodology used to perform the measurement is enclosed to support this interpretation. Accordingly, the intended meanings for  $V_2$  and  $V_1$  would be understood in this context. If the Examiner wishes a more detailed explanation of DIN 66 133 methodology, one can be provided.

In light of the changes to claim 1 and the comments provided above, withdrawal of the rejection is respectfully requested.

Claims 1 and 7 are rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103 as obvious over Lagarde et al. Applicants respectfully traverse this rejection.

Lagarde et al. is relied upon by the Examiner to teach precipitated silica adapted for use as a filler material in curable elastomers. The Examiner indicates that the silicas employed in the reference inherently possess the physical

parameters recited in claims 1 and 7 and, therefore, would either be inherently taught or reasonably suggested by Lagarde et al.

Applicants urge that the claimed products are distinct from those of Lagarde et al. because the precipitated silicas actually differ as to some of the characteristics which can be compared and also as to the uses for which they are employed.

The claims as amended are clearly drawn to a distinct precipitated silica which is characterized by a  $V_2:V_1$  ratio (determined with the mercury molding method) and by a DBP:CTAB ratio. These two parameters along with the other listed parameters identify a precipitated silica suitable for use in the manufacture of tires. See page 7 at lines 23-26 where the silica of the invention is used in natural rubber mixtures for tire manufacture. The tires made from rubber mixture containing the precipitated silica of the invention exhibit considerably improved properties, e.g. a higher modulus, a lower roll resistance and a better wear resistance. These advantages and others are found on page 10, lines 16-23 of this application. In contrast, Lagarde et al. is concerned with the development of a precipitated silica as a filler material for reinforcement of organosilicic polymers. Lagarde et al. employs a different silica material to start with (see column. 4, last paragraph and column 5, first two paragraphs). The silica employed in the invention results from the addition of the acid to the water

glass solution in one step (see example 1). Cf. Lagarde et al. where the acid is added to the water glass solution in several distinct steps. This difference in starting material should be considered when comparing the products.

Further, the silica product of Lagarde et al. has a specified composition (see tables in column 2) and is prepared in a specified fashion which permits blocking of any micropores (see column 5, lines 1-12). The resulting product is not used to manufacture tires but rather is added to silicone rubber to form mixtures which are vulcanized. The end product specifically mentioned by Lagarde et al. is crepe rubber-soled shoes. See column 14, line 27. This silicone rubber product on its face does not appear to meet the requirements of automobile tires in regards to wear resistance, mechanical strength and tear resistance.

Also, Lagarde et al. describes a precipitated silica which is characterized in column 2, lines 1-34 in terms of physicochemical data. Among the other listed properties, the silica of Lagarde et al. is characterized as having a sodium content which must be less than 500 ppm. The low sodium content of the precipitated silica is necessary for their product. See Example 2. It can be gathered from column 2, lines 6-14 in Lagarde et al. that the precipitated silica with the low sodium

content of <500 has the same reinforcing action as a pyrogenically produced silica.

Please note that the specific volume  $V_0$  of Lagarde et al. has nothing in common with the claimed  $V_2/V_1$  ratio range (note explanation above). Lagarde et al. measures only the volume which a silica occupies after a pressure load of 4 kg/cm<sup>2</sup>. In contrast, the Hg porosimetry used in accordance with the invention measures macropores, placing the Hg consumption for a certain pore size (17.5 - 27.5 nm) in a ratio with a total Hg consumption for pores less than 40 nm. Accordingly, this ratio should be given weight in distinguishing the products.

Further in this regard, two technical brochures from Degussa AG are included which provide information as to Si 69 and "Orgsnosilane fur die Gummundustrie".

In light of the enumerated differences, the product of Lagarde et al. is clearly different from that claimed. Further, since the product of Lagarde et al. is utilized for a different purpose than that claimed, it is not clear what guidance and motivation exists within the reference to motivate one of ordinary skill in the art to make the necessary changes to arrive at the claimed product.

Accordingly, in light of the amendments to claim 1 and the arguments, supra, withdrawal of this rejection is respectfully requested.

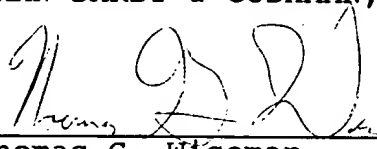
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Having addressed all the outstanding rejections, allowance of the claims is deemed in order and a Notice to that effect is respectfully requested.

Respectfully submitted

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